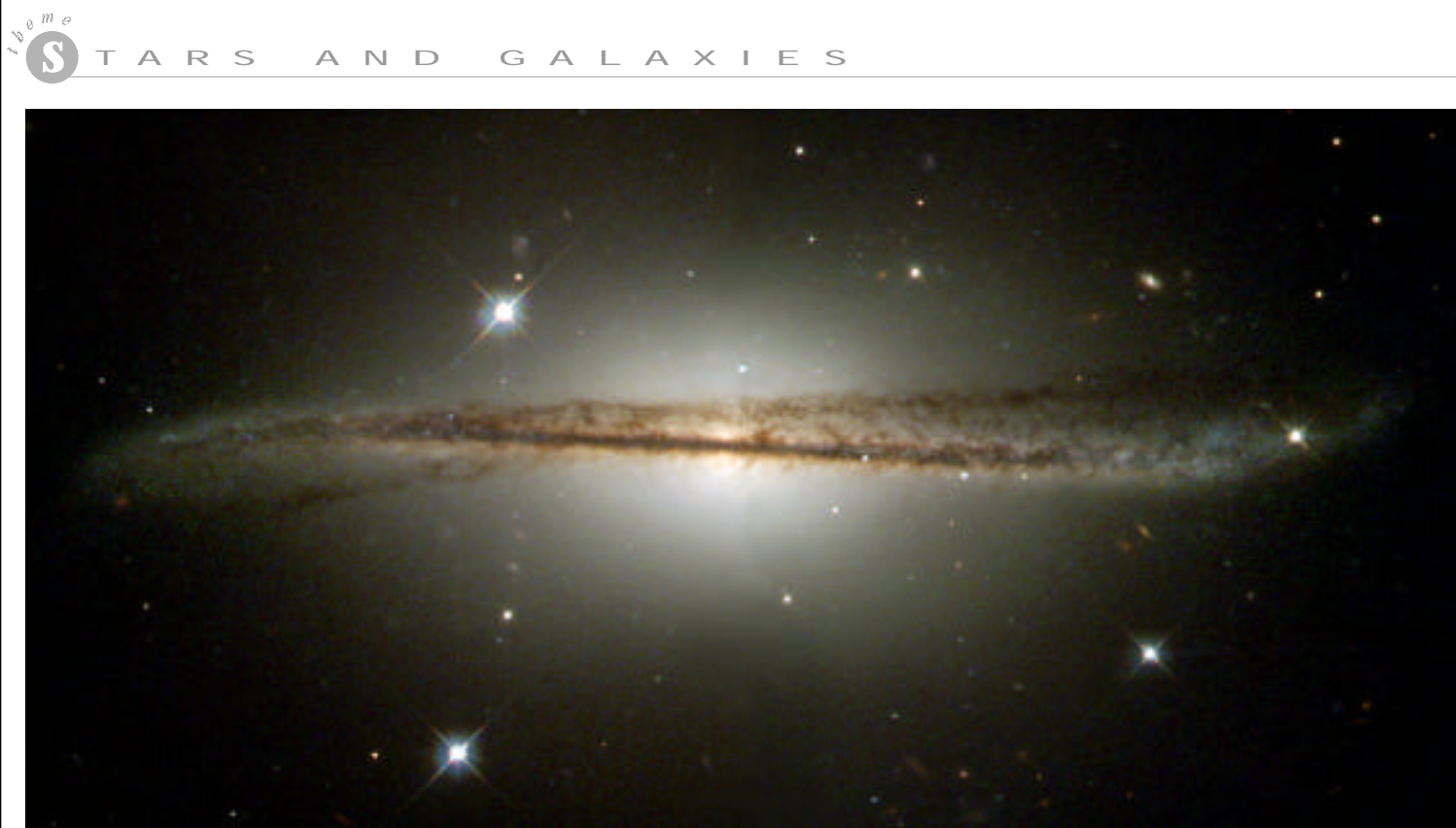


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Hubble Views Warped Galaxy as Camera Passes Milestone

by Jane Platt



NASA and The Hubble Heritage Team (STScI/AURA)

NASA’S HUBBLE SPACE TELESCOPE *has imaged an unusual edge-on galaxy, revealing remarkable details of its warped dusty disk and showing how colliding galaxies trigger the birth of new stars.*

During observations of the galaxy, the camera passed a milestone, taking its 100,000th image since shuttle astronauts installed it in Hubble in 1993. The camera was designed and built by JPL. The dust and spiral arms of normal spiral galaxies, like our Milky Way, look flat when seen edge-on. The new image of the galaxy ESO 510-G13 shows an unusual twisted disk structure, first seen in ground-based photographs taken at the European Southern Observatory in Chile. ESO 510-G13 lies in the southern constellation Hydra, some 150 million light-years from Earth. Details of the galaxy’s structure are

visible because interstellar dust clouds that trace its disk are silhouetted from behind by light from the galaxy’s bright, smooth central bulge. The strong warping of the disk indicates that ESO 510-G13 has recently collided with a nearby galaxy and is in the process of swallowing it. Gravitational forces distort structures of galaxies as their stars, gas, and dust merge together over millions of years. When the disturbances die out eventually, ESO 510-G13 will become a single galaxy. The galaxy’s outer regions, especially on the right side of the image, show dark dust and bright clouds of blue stars. This indicates that hot, young stars are being formed in the twisted disk. Astronomers believe new star formation may be triggered when galaxies collide and their interstellar clouds are compressed. The image, taken by Hubble’s Wide Field and Planetary Camera 2, is online at <http://heritage.stsci.edu> and <http://www.jpl.nasa.gov/images/wfpc>.

Bad Weather Postpones Genesis’ Date with the Sun

Weather has once again hindered the launch of the Genesis mission. The August 2 launch of NASA’s Genesis spacecraft has been postponed due to thick clouds and wind at the launch site. The launch was scrubbed August 1 due to weather as well. The next opportunity for launch of the Genesis space-

craft is Friday, August 3, at 12:23:53 p.m., EDT. At press time it was uncertain if weather conditions in the Cape Canaveral area would allow a Friday launch. Liftoff will occur aboard a Boeing Delta II rocket from Pad A at Launch Complex 17 on Cape Canaveral Air Force Station.

The launch attempt on July 30 was canceled over concern for a power supply component in the star tracker unit on the spacecraft. The component recently failed during a simulated space environment test not related to the Genesis mission.

Jason 1 satellite arrives at Vandenberg Air Force Base

The Jason 1 satellite arrived Tuesday July, 31 at Vandenberg Air Force Base to begin final preparations for launch no earlier than Sept. 15. A joint project of NASA and CNES, the French space agency, Jason 1 is the follow-on to TOPEX/Poseidon, a U.S.-French spacecraft that has been making precise measurements of ocean surface topography since 1992. These data are used to map ocean currents, improve the understanding of ocean circulation, measure global sea level change and improve global climate forecasts. The French-built Jason 1 spacecraft was flown from Nice, France, to Vandenberg on an Antonov-124 cargo plane and then transported to a clean room at Spaceport Systems International, located on the base. After French and U.S. project members complete their final adjustments and tests, the spacecraft will be fueled and turned over to the Boeing Company on Aug. 22 in preparation for launch. Jason 1 will be launched from Space Launch Complex 2 West at Vandenberg Air Force Base atop a Boeing Delta II rocket. The rocket



Bruce A. Campbell / GSFC

The Jason 1 team
(pictured left to right)
Mike Davis, Tom Shain,
Chris Alvarado, and
Gary Kunstmann
(Project Manager).

has a dual payload system that allows the launch vehicle to carry two satellites at once. Jason-1 will share part of the ride with another spacecraft called Timed, a joint atmospheric mission of NASA and the Applied Physics Laboratory, Laurel, Md. Jason 1 will be carried at the top of the rocket’s nose cone and will separate first. The launch window is about 20 minutes each day. On Sept.15, the window opens at 12:59 a.m PDT. The launch window gets earlier by about 12 minutes each day. Once it reaches its final orbit, Jason 1 will assume the flight path of TOPEX/Poseidon, which will move into a parallel orbit. They will circle Earth every 112 minutes at an altitude of about 1,330 kilometers (830 miles), measuring the surface topography of the oceans to within 4 centimeters (about 2 inches)

News Briefs

Mars ascent vehicle studies awarded

NASA's Mars Technology Program at JPL has awarded three industry contracts for the development of concepts for a small rocket that will lift science samples gathered by NASA's Mars Sample Return mission from the Martian surface and support their return to Earth.

A panel consisting of propulsion experts including NASA's Marshall Space Flight Center and JPL selected these companies from the five that responded to the request for proposals. The awardees are:

- Boeing Company, Huntington Beach
- Lockheed Martin Corp., Denver
- TRW, Redondo Beach

The contracts are valued at \$300,000 each and are to be performed over a six-month period. These studies will provide independent concepts and technology roadmaps to develop a Mars Ascent Vehicle for the Mars Sample Return mission. Concepts emerging from these studies will contribute to the final specifications for the eventual Mars Ascent Vehicle.

"The Mars Exploration Program is looking at a wide variety of ideas and concepts to conduct the Mars Sample Return mission," said DR. SAMAD HAYATI, manager of the Mars Technology Program at JPL. "A small, reliable launch vehicle that would launch collected samples from the Martian surface months after initial arrival is considered one of the key building blocks requiring development. Launch of a sample return mission is scheduled for no sooner than 2011."

'Midriff bulge' detected in star

For the first time ever, a star spinning so fast its mid-section is stretched out has been directly measured by an ultra-high-resolution NASA telescope system on Palomar Mountain near San Diego.

"Measuring the shape of this star, Altair, was as difficult as standing in Los Angeles, looking at a hen's egg in New York, and trying to prove that it's oval-shaped and not circular," said Dr. Charles Beichman, chief scientist for astronomy and physics at JPL.

Altair is a well-known member of the Summer Triangle, clearly visible in the summer night sky across the United States. Scientists using the Palomar Testbed Interferometer, which links multiple telescopes, measured the star's radius at different angles on the sky. They noticed the size of the star varied with changing angles, which was the first tip-off that Altair is not perfectly round.

"This surprising observation led to

a bit of challenging detective work to properly interpret the data," said principal investigator Dr. Gerard van Belle of JPL. "We measured the size of another star, Vega, at the same time, which didn't change with angle, so we knew this wasn't just a fluke of the telescope."

Previous studies of Altair raised the prospect that the star might have midriff bulge, but never before had the shape been measured directly. Earlier measurements of the star's spectrum, or light-wave pattern, had hinted that Altair was rotating very fast. When a gaseous orb, like a star, spins fast enough, it tends to expand at the middle, like a beach ball that is squeezed at the top and bottom.

Altair is a perfect example — it rotates at least once every 10.4 hours, and the new Palomar observations reveal the diameter at its equator is at least 14 percent greater than at its poles. For a star that spins slowly, this effect is miniscule. For example, our Sun rotates once every 30 days and has an equator only .001 percent greater in diameter than its poles.

By measuring Altair's size at separate positions along its edge, van Belle and his colleagues determined that Altair rotates at a speed of at least 210 kilometers per second (470,000 mph) at the equator. Future studies may pin down the speed more precisely.

As of Monday, Odyssey was 45.8 million kilometers (about 28.5 million miles) from Earth and 30 million kilometers (about 19 million miles) from Mars, traveling at a velocity of 26 kilometers per second (58,000 mph) relative to the Sun.

Blood drive set for mid-August

The next JPL/Red Cross Blood Drive will be held in von Kármán Auditorium Aug. 14 from 10 a.m. to 4 p.m. and Aug. 15 from 7 a.m. to 1 p.m.

Sign-up sheets will be available prior to the blood drive at Occupational Health Services (Bldg. 310-202), and Occupational Health Services' Web site at http://eis/medical/blood_form.html.

Last-minute signups are available at von Kármán Auditorium. Be prepared to wait a little longer if you do not have an appointment.

To change an appointment, call the Pasadena Red Cross, (626) 799-0841, ext. 630.

Occupational Health Services said the Red Cross collected 178 pints of blood during the previous blood drive, of which 534 lives will benefit.

The Red Cross is currently experiencing a critical shortage of all types of blood, especially O negative, and their inventory continues to remain below desired levels.

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meetings are available. Call the Employee Assistance Program at ext. 4-3680 for time and location.

Codependents Anonymous—Meeting at noon every Wednesday. Call Occupational Health Services at ext. 4-3319.

End of Life Issues and Bereavement—Meets the second Monday of the month at noon. For location, call the Employee Assistance Program at ext. 4-3680.

Gay, Lesbian and Bisexual Support Group—Meets the first and third Fridays of the month at noon in Building 125-133. Call the Employee Assistance Program at ext. 4-3680 or Randy Herrera at ext. 3-0664.

Parent Support Group—Meets the third Thursday of the month at noon. For location, call the Employee Assistance Program at ext. 4-3680.

Senior Caregivers Support Group—No meetings are scheduled for August; next meeting is Sept. 6. For time and location, call the Employee Assistance Program at ext. 4-3680.

Friday, August 3

"The Quest for Mission Success: the Clementine Mission"—Dr. Trevor Sorensen, former Clementine Lunar Mission Manager, will speak from 1:30 to 3 p.m. in the Building 167 conference room. Sponsored by the Reliability Engineering Office 513.

Tuesday, August 7

JPL Gamers Club—Meeting at noon in Building 301-227.

JPL Genealogy Club—Meeting at noon in Building 301-271.

Wednesday, August 8

JPL Amateur Radio Club—Meeting at noon in Building 238-543.

JPL Toastmasters Club—Meeting at 5 p.m. in the Building 167 conference room. Guests welcome. Call Joy Hodges at ext. 4-7041.

Tuesday, August 14

JPL Stamp Club—Meeting at noon in Building 183-328.

Tues., Aug. 14–Wed., Aug. 15

Investment Advice—One-on-one counseling sessions are available with TIAA/CREF. For an appointment, call (877) 209-3140, ext. 2614.

Wednesday, August 15

"Retirement in View"—This workshop for employees who are more than more years from retirement will be held from 10 a.m. to noon in Building 180-101. The presentation reviews retirement lifestyle and financial considerations. Pre-retirees will work through retirement expenses, income sources, and strategies to help close any gaps.

Thursday, August 16

TIAA/CREF Enrollment—This monthly meeting is designed to assist employees newly eligible for Caltech/JPL retirement plan participation in selecting investment options and completing enrollment forms. At noon in T1720-137.

NOVA awards

- Section 320:* Jon Depew, William Williamson, James W. Young.
- Section 3211:* Stephanie Blueford, Rebecca Custer, Sheryl Jackson, Stacy Klinger, Tyrone Little, Hanh Milam, Bonnie Miller, Colleen Miyahara, Darlene Padgett, Catherine Quinn, Scott Yeats
- Section 3212:* Hubballi Aladdin, Carroll Brown, Sharon Chapman, Anita Lacroix, Johnny Lopez, Sarah Nichols, Keri Smith.
- Section 3213:* Carmen Ascencio, Anthon Davis, Jacqueline Gonzalez, Maria Klein, Brian Knosp, Deronda Mayes, Andre Myles, Sheryl Owen, James W. Young
- Section 3214:* Sherri Akbari, Kristina Kim, Nancy King, Carmen Lam, Yvonne Nappier, Michael Orosco, Theresa Rafter, Vivian Rother, Jean Rubin, Rachel Skinner, Yolanda Swanson.
- Section 331:* Abhijit Biswas, Christine Chang, Jose Fernandez, Carl Franck, Theodore Hanson, Hamid Hemmati, Raymond Jurgens, Jan Loreman, David Morabito, Gerardo Ortiz, Leslie Paal, Peggy Park, Annie Parkhurst, Samuel Petty, Fabrizio Pollara, Kevin Quirk, Martin Slade, Meera Srinivasan, Colleen Tyler, Arvydas Vaisnys.
- Section 333:* Victor Chen, Herschel Jackson, Christopher Link, Manfred Richter, Asim Sehic.
- Section 350:* Linda Barcena, Gerrard Panahon.
- Section 353:* Mark Anderson, Gajanana Birur, Gani Ganapathi, Carl Guernsey, Patricia Hayes-Rowe, Steven Jones, Soon Sam Kim, Violet Kitts, Allison Owens, Morgan Parker, James Polk, Nazilla Rouse, Partha Shakkottai, Robert Shotwell, Eric Sunada, Brenda Watkins, George Yankura.
- Section 354:* Richard Beatty.
- Section 357:* Robert Burke, James Crosby, Sharon Dew, Charles Foehlinger, Randall Foehner, Darrol Houser, Kathryn Iwanaga, Andrea Kapitanoff, Gary Keel, Larry McCain, Robert Moncada, Juan Pacheco, Scott Premo, Edward Springer.

- Section 366:* Juli Adams, Bryan Arnestad, Jay Braun, Tommy Dearmond, Sandy Gutheinz, Rudy Gutierrez, Lawrence Hawley, Susan Kientz, Tony Kwok, Gloria Lang, Jason Liao, Kathryn Little, Francis Lorenzana, Keri Murphy, Edward Noon, Richard Redden, Mary Rivera, Norma Soto, Eric Tailor, David Wilcox.
- Section 367:* Benjamin Bornstein, John Crawford, Barbara Engelhardt, Russell Knight, Darren Mutz, Gregg Rabideau, Robert Sherwood, Benjamin Smith.
- Section 368:* Magdy Bareh, Antonio Sanders, Robert Sherwood, Eric Tauer, Peter Tay, Karen Yetter.
- Section 369:* Lydia Dubon, Harold Minuskin, Paul Pechkam.
- Section 383:* Lawrence Azevedo, Debra Camp, Rosemary Diaz, Jennifer Gregory, Gary Kuan, Peter Lawson, Raymond Savedra, Olga Shchedrin, Robert Smythe, Mitchell Troy, Dorian Valenzuela, Feng Zhao.
- Section 386:* Meng Chiao, Robert Dengler, Andy Fung, Tigran Karsian, Jonathan Kawamura, Amarit Kitiyakara, David Pukala, Hans Rosenberger, Nancy Zeavin.
- Section 388:* Mari Castillo, Shirley Giuggio, Zareh Gorjian, Elizabeth Kay-Im, Elmain Martinez, Myche McAuley, Helen Mortensen, Susan Pocino, Regina Sakurai, Thomas Thaller.
- Section 389:* Richard Chen, Don Cheney, Sean Hardman, Rodney Hoffman, Douglas Hughes, Jennifer Kesterson, Jason La Pointe, Sauwan Leung, Cindy Robles.
- Section 400:* Nune Boyadjian, Enrico Bruno, Marilynn Davis, Claudia De Luna, Peggy Easter, Geoffrey Lake, Diane Mann, Valerie Pickett, Christine Preheim, Cheryn Roff, Karl Strauss, Jean Tellep, Valerie Thomas.
- Section 700:* Donna Avila, Kirk Bilby, Catherine Cagle, Nickolas Climes, Rolf Danner, Deborah Fambro, Thomas Gautier, George Greanias, Mahnaz Hashemi, Daniel Hurley, Joseph Kahr, Helenann Kwong-Fu, Jitendra Mehta, Karla Miller, Aurelio Tolivar, Tsun-Yee Yan.

So Long, Kirk



After 39 years of service to the Laboratory, Kirk Dawson, Institutional Associate Director, retired in July. Dawson began his career as a power engineer in Division 34 and held a number of line management positions, including Assistant Laboratory Director for Technical Divisions. As Associate Director, he was also recently responsible for the Laboratory's administrative and financial organizations. The scope of his line management experience is unmatched in JPL's history.

On July 23 Dawson was honored by his colleagues, family and community members at the Pasadena Hilton.

THE FIRST 100 DAYS

In August, Dr. Charles Elachi will reach 100 days in his new position as Lab Director . He discussed his tenure with the Universe.

QUESTION *It's been three months since you began as JPL Director. What are your impressions so far?*

A Things are going well. I've found that there are many different challenges to this job, because it covers not only technical and programmatic areas, but also personnel, legal, and other issues.

I have been particularly encouraged by all the support I've received from JPL employees and the Executive Council. I want to stress how delighted I am with employees' positive attitude and excitement about what we do at JPL. I'm particularly encouraged that everybody wants to help make the Lab successful and a better place.

QUESTION *Three months ago you endorsed some changes in the top levels of the organization. How is that going?*

A I wanted to integrate technology, science and missions in specific directorates, and put an emphasis on the interplanetary network and the Deep Space Network, because that's very important to our future.

What's new about the Executive Council is that appointments are for limited terms. The intent is to make sure we build a strong, broad base of senior managers. After serving on the council, EC members can serve as project managers or in other senior positions. In the long term, this approach will be healthy for JPL and for senior managers.

Recently, I appointed Gael Squibb to the Director's Office. Dr. Bill Weber will be heading the 9X organization (Interplanetary Network and Information Systems Directorate), and John Beckman will be heading the 3X organization (Engineering and Science Directorate).

That effectively completes all the appointments except for the chief technologist, for which we will be doing a national search. Dr. Barbara Wilson, who has been the chief technologist, will fill that role for the Air Force Research Lab for three years. She will then come back to JPL. This will help strengthen the relationship between JPL and the Air Force.

did not go and tell the Travel organization what to do; I only said we need to make things easier for employees and reduce the paperwork.

I want to applaud the team for both taking the initiative to make the improvements and also on the results (Editor's note: see the Travel Web site at <http://www-afd/travel/travel.htm>). The team has significantly simplified the process, made it more flexible and more employee-responsive.

I'm encouraging other organizations—be it on the technical side or the business side—to use this as an example of taking the initiative to simplify things.

QUESTION *Speaking of simplifying things, one item in the press had you "throwing out the rulebooks." Was that an accurate statement? What does that say about DMIE?*

A No, we are not throwing out the rulebooks. The statement I made is that we're going to look at all of our rules to determine which ones are helping our jobs and which ones are making it harder. The Design and Maintain the Institutional Environment (DMIE) team is currently reviewing all rules and procedures to see which ones need to be simplified or eliminated altogether, and which ones are necessary for us to be a safe place and to do things successfully.

I want to make sure the rules are simple, accessible, and constructive; that they are helping us, not slowing us down. Once we that examination, I expect everybody to follow the rules.

QUESTION *What other pressing work-related issues are currently being addressed?*

A We are discussing the expansion of the number of job classification levels, or slots. There was also a concern about scientists, engineers and technologists not being able to move to the highest level of employment at JPL unless they became managers. That's going to change.

We will provide additional administrative support for group supervisors so they can focus on the technical issues, and on managing their group. When things need to be done above and beyond their normal mode of operations, we will provide the funds to do that.

We promised project managers that we would look into reducing, and focusing, the number of reviews required for mission development, and we are talking with NASA Headquarters about this now.

In May I promised I would meet with group supervisors every six months, and last week I completed the first in that series of meetings. I've also begun to establish a schedule to meet with groups of all employees.

My intent is to have another all-hands meeting in late September to address these and all other actions that have been taken since I became director.

QUESTION *What about the new management councils you've created? How are those progressing?*

A We're just starting the councils. Basically, we divided the EC's activities into four areas.

The council for science and technology will be provided with the burden funds for that area, and will be responsible for the allocation, for instance, for the Centers of Excellence funding. The council will look at the strategic approach of how we address our technology issues, and how we create a stable environment for our researchers.

The council for flight projects focuses on how we create the environment, capability, and procedures to be successful in our flight projects, and to ensure having the necessary engineering infrastructure.

The business management council is now examining our burden budget. They're also looking at job slotting, as well as other areas such as rules and procedures.

The strategic management council is working to create 10- to-20-year strategy for JPL. I gave them a tight schedule to do it; I'd like that plan worked out by the end of the calendar year, including a series of milestones between now and then.

" I want to stress how delighted I am with employees' positive attitude and excitement about what we do at JPL. I'm particularly encouraged that everybody wants to help make the Lab successful. "

QUESTION *You also spoke about your desire to cut bureaucracy, to make life a bit easier for employees. Is there any progress thus far?*

A Yes. The first good example is the recently announced improvements in travel policies. I

QUESTION *Why such a long-term outlook?*

A We want to have a specific plan for the JPL of the next 10 years as well as a more general plan for the following 10 years. The plans will seek to identify the activities we will be doing in-house, and the kind of capabilities we will need—both talent and facilities.

We will go through a series of iterations in the coming months, and I want to make sure there is a broad buy-in to the strategic plan, both internal and external. The EC will review the plan, followed by input from senior managers, division managers and project managers. There will also be numerous opportunities for all employees to see the report before it's finalized. We'll also have a Caltech "visiting committee" provide input, and I'm also going to form an independent peer-review group to serve as an advisory council.

QUESTION *What's the latest on JPL's and NASA's budget for the upcoming fiscal year?*

A We are in the midst of the budget cycle. The House has supported the NASA budget—and the things related to JPL—fully, and all of our activities in their version of the budget bill are funded. In the Senate bill, there are three areas we're following closely: a proposed reduction in the Mars budget; a proposition

continued from page 3

that the Europa Orbiter should be competed; and a proposal that Deep Space Network operations be transferred to the Consolidated Space Operations contract.

We and NASA Headquarters are doing all we can to explain to Congress the implications of those actions. I'm confident that in the end, people will agree with us that there should not be a change.

By the way, the same thing happened two years ago, when it was proposed that operations be transferred to the Consolidated Space Operations contract, and Congress was convinced that it was not the right thing to.

QUESTION *Genesis is coming up for launch, your first as director. Your feelings?*

A All of us at JPL look forward to launches, rendezvous, landings, etc., so in a sense a launch is a combination of five or six years of a lot of effort. Genesis is not only a very exciting scientific mission, it's also an example of how JPL can indeed successfully do science-driven missions in a constrained-budget environment. This will be the first sample-return mission since the Apollo Program and the first sample from beyond the moon.

This is the third JPL mission in the Discovery Program. The first one was Mars Pathfinder; the second was Stardust, which is on its way to a comet right now. Our next Discovery mission after Genesis will be Deep Impact, which will launch in 2004.

Letters

Thanks very much to the ERC for the plant and to my co-workers in Section 351 for their expressions of sympathy over the recent death of my father after his long illness.

George Wells

Bruce and I would like to thank the AIRSAR Group and 334 for the comfort and understanding of the recent illness and passing of my grandmother. Thanks to the ERC for the lovely plant.

Lori and Bruce Carrico

Passings

DAVID KUMA, 62, a former systems engineer in Section 332, died of cancer July 10 at his home in Rancho Cucamonga.

Kuma worked at JPL from 1975-94. He is survived by his wife, Essie, six children and 10 grandchildren. Services were private.

Correction

In the July 6 issue of Universe, an articles in the Passings column report-ing the passing of Elmer Hastings should have indicated that he is sur-vived by his wife, Ann , as well as his children and grandchildren.

Classifieds

For Sale

AIR CONDITIONER, 3 ton, electric, like new, purchased at \$3,500, sell \$600. 368-9520, after 6 p.m.
BABY GYM, Fisher Price, was \$40, now \$10; STROLLER, Emmaljunga, side by side double stroller, hunter green, top of the line, like new, purchased for \$399, sell \$299.626/ 850-4378.
BABY/TODDLER ITEMS, Little Tykes toddler playgym with slide, \$35; sandbox, new and used baby/toddler girl items and toys; HIKING BOOTS, new, Vasque, ladies, size 7, \$75; BIRD CAGES, new/used. 626/798-6248.
BED SET, 7 piece, double canopy, includes box spring and mattress, cream/yellow trim, all wood, vg cond., \$800/obo. 368-6303.
BEDROOM SET, girls, charming, incl. head-board, twin bed with canopy, bedspread, sheets, etc., dresser, mirror, nightstand + many accessory pieces, all matching, \$400/obo. 626/791-1581.
BICYCLE, Schwinn, 10 speed, 24" frame, black, \$95. 626/793-3082.
BICYCLE, specialized road bike, 1991 Allez, lg. carbon fiber frame, Suntour 12-spd shifters, very light & stiff, both triathlon & std drop bars, Look pedals, \$300. 626/794-0886, Ted.
BICYCLES, children's, \$10/ea; COOLER, Coleman, used once, \$15. 626/357-8210.
BOOKCASE, black, 6' 8" tall x 2' 8" wide x 11" deep, 5 adjustable shelves, attached light, IKEA modern, \$75. 626/798-4265.
CD JEWEL CASES, 50, \$10; JENNY CRAIG diet tapes, set of 14, \$50; COMPUTER POWER CONTROL CENTER, 5 power switches + 1 master switch, 5 surge-protected outlets + 2 modem/fax/phone jacks, new, \$20; ORGAN, Yamaha 415 electronic console w/13 pedals, 3 keyboards, 144 rhythm patterns, pd. \$7,500, sacrifice for \$3,000. 818/790-3899.
COFFEE, Kona, top of the line, 100% pure, hand picked from top quality trees, 100% sun dried, rich, dark roast, limited supply, discount-ed 45% at introductory price of \$21/lb. 626/584-9632.
COMPUTER, Gateway Essential 450, 450 MHz P3, 128 MB, w/17" monitor and HP printer, 2 yrs. old, \$550/obo. 562/923-4347, eves.
COMPUTER EQUIPMENT, vg cond., power com-puting, PowerBase 180, Mac clone, 180 MHz 603e, 32 MB RAM, \$100; HP LaserJet 6MP printer, localtalk and parallel connectors, \$50; ZIP 100 drive, SCSI connector, \$25; Global Vil-lage Teleport 56K modem, serial connector, \$5. 626/577-0068.
COMPUTER MONITOR, new, in box, eMachines eView, 15P, 15" color monitor, 13.8" viewable, .28mm dot pitch, digital control, plug & play, non-glare, flat screen, 1024 x 768, 60Hz, \$60. 353-6369, eves.

CRIB AND DRESSER SET, Bellini, exc. cond., \$600. 952-7472.
DRAFTING/DRAWING TABLE, 23" x 31", wooden, adjustable tilt/height, exc. cond., \$65. 626/304-0737.
DRESSING TABLE, art deco, wood, antique, vanity w/mirror and 5 drawers, circa '20s-'30s, great cond., \$350. 368-9520.
ENTERTAINMENT CENTER, IKEA, for up to 36" TV, near new, cherry wood color, \$100/obo. 249-4536.
ENTERTAINMENT CENTER, holds 27"- 30" TV, 4 adjustable shelves, glass front, VHS/CD storage, 5' wide x 4' tall x 20" deep, IKEA black modern, \$150. 626/798-4265.
FRAMED ART WORK, 2 custom finished wood framed poster works, very colorful, one is Aus-tralian flags and the other is Australian parrots, frames about 32" high by 20" wide, ideal decorative items for family room, office or den, \$32/ea. 236-4869, after 5 p.m.
FURNITURE: King size bed with mattress, looks nice, includes 2 chests; washer & dryer, good cond. 626/584-1164.
FURNITURE: leather sofa, beige, matching loveseat, \$900; entertainment center, 3 pc., solid wood, \$225; dinette set w/4 chairs and 2 barstools, \$95; futon, \$15; waterbed, motionless, \$150; dresser, \$20; computer desk w/hutch, \$50. 626/793-3082.
KITCHEN CABINET, with stainless steel sink, chrome faucet and spray, white Formica cabinet with 3 doors and 1 drawer, 39" H x 52 " W x 26" D, \$65. 626/798-0329.
MICROWAVE OVENS: Sharp, simplest operation, no turntable, works perfectly, \$45; Sharp, includes turntable, easy-to-use, almost new, exc. for student, senior, sm. apt. or second oven, \$60, buy both at a discount. 310/393-1951, in Santa Monica.
MISC: TV, 27" Zenith, with GE 4-head video; washer and dryer, Maytag; dryer is gas, both very reliable; assorted small kitchen appliances; pine tables and chairs, sofa, sofa/futon, assorted lights and lamps, blinds, cane garden furniture, assorted pot plants, Q/size pine bed, pine dresser, drawers, interna-tional relocation, any reasonable offers accept-ed. 323/547-4920, Tom, cell.
MISC: blood pressure meter, automatic unused, \$40; lawn mower, rotary Cadet, \$125; plastic Xmas tree; Garmin 45 XL GPS, \$100; VCR, \$30; Nikon F3 w/2 lenses, \$250; piano, Knabe spinet, \$300; sump pump, 5 amp, \$30; sewing machine, Singer, old treadle, \$225; sewing ma-chine, Sears 1975 model, \$100. 790-0697.
MISC: Cassiopeia EM-500, Pocket PC, Windows CE, Excel, Word, Internet, Pocket Streets, adv. scientific/finance calculators, MP3 player, digi-tal voice recorder, color, handwriting recognition, holster case, manual, box, warran-ty, brand new, \$299; speakers, center channel, 150W, Cerwin Vega, efficient, exc. cond, \$59; car stereo, Toyota AM/FM/ cass, 1998, exc. cond., \$49. 909/592-9279.
MISC: computer desk, solid oak, \$250; bookcase, oak, \$40; file cabinet, oak, \$20; audio cab., glass front, \$30; TV stands \$20/ea.; carpet, Persian, 9 x 12, pd. \$3,600, \$1,800; 2 bd. dressers & mirror, \$100; recliner, leather, \$100; end table; Ethan Allen; Japanese doll; large stereo cab. with speakers, \$100; refriger-ator; washer; dryer. 790-0697.
MOVING SALE: Amana refrigerator, white, 4 yrs. old, \$400; washing machine, Kenmore, white, 2 yrs. old, \$250; gas dryer, Kenmore, white, 2 yrs. old, \$200; generator, Coleman, 3500 Watts, 100 hrs. op. time, \$200; Nordic Track \$100. 626/798-8065.
PIANO, Schaefer & Sons spinet, w/bench, great cond., pecan finish, ideal for beginner, \$450. 795-8962.
PILOT CASE, great for school or business, lots of pockets, \$30; DASH PROTECTOR, blk, '95 Honda, \$20. 362-3358.
REFRIGERATOR, used Sears Coldspot model 106.D9F2-B, clean, white, 10 cu. ft. capacity, ice tray, all shelves, 2 crisper drawers, meat drawer, ideal for a second refrigerator in garage for holiday overload or big party, \$50 if picked up, \$75 if delivered (within 25 miles of my house). 248-3260, evenings.
SOFA, sectional sleeper, makes into queen-size bed, attractive abstract water color design in cream, aqua, mauve, great cond., \$350;
COFFEE TABLE, white oak finish, with glass panels, like new, see photos at ERC, or call for email photo, \$100. 830-8993, eve & wkend, 903-8979, cell.
SOFABED, beautiful, lt. green velvet, sturdy wood frame, paid \$1,100, sell for \$500/obo. 805/234-0323.
SURFBOARD BAG, holds four boards, \$20. 790-5643.
TABLE, dinette, square glass top 5' x 5' w/metal feet and 4 matching chairs, \$700/obo; BAR STOOL, four matching, metal frame, all in superb condition, \$300/obo. 626/398-3480.
TABLE, dining for 8, w/china cabinet, beautiful cond., walnut color w/hand-designed side trim-mings, \$400/negotiable. 213/614-0029, Harriett.
TELESCOPE, 8", Celestron C8 Schmidt-Cassegrain 6, 17, 25 and 40 mm eyepieces, Pelican case, bought in 1996, like new, \$1,500. 626/798-4016 or czrider@pacbell.net.

However, it's most important to point out that in all of these missions, we will make sure to not jeopardize the quality of the mission and the criteria for success. In the case of Genesis, it was originally scheduled to launch in January, but I credit Ed Stone for the decision that a launch at that time was not appropriate or wise, that it would be safer to delay it. I think it was the right decision.

QUESTION *Beyond Genesis, the Lab has a busy year ahead, doesn't it?*

A Yes, and it's going to require all of our best efforts. Still to come in 2001 is Mars Odyssey going into orbit Oct. 23, the launch of Jason [an oceanography mission sched-uled to launch in September] and the Gravity Recovery and Climate Experiment (GRACE) [planned to launch in November]. Galaxy Evolution Explorer will launch next spring, and Space Infrare Telescope Facility (SIRTF) launch will be coming up next July.

We also have a very critical period in the next year with the Mars Exploration Rovers. I acknowledge that the team members are working very hard. I've told the team and senior managers if there's anything I or the Executive Council can do to help them, to let me know about it. It's a big challenge, but when we do these missions well, the rewards are great.

Free

DOG, small, black dachshund/lab mix puppy; very friendly, sweet, affectionate; recently spayed, has all shots; great with kids, dogs and cats. 626/301-1538.
DUCKLINGS, white, one month old. 626/795-4537.
PLANTS, Agapanthus (Lily of the Nile) and Bird of Paradise. 626/793-3393.
WASHER/DRYER, Kenmore dryer, works great, Whirlpool washer, needs some work, must take together. 248-8103, Mike.

For Rent

ARCADIA, charming guesthouse, separate entry, overlooking a small garden, furnished, laundry facilities, no pets, non-smoker, shared utilities, \$795. 626/441-0041, Kris.
BURBANK HILLS, 4 bd., 1.75 ba., gardener, complete new int., cl. to schools, huge yard, 20 min./JPL, \$2,600. 843-7180.
LA CANADA guest house, studio, 1 ba., on horse trail, less than 1/2 mile to JPL, private and quiet, carpet, covered parking, loft, patio, cable modem, large storage attic, 2 yr. lease, \$650 inc. gardener & utilities. 790-0490 or 626/683-0282, Judy.
LA CANADA guest house, 1 bd., 1 ba, study, 1.5 blks./Palm Crest Elementary School, avail. 9/15, \$950. 952-8638, Susan, after 6 p.m.
NORTH ALHAMBRA, borders South Pasadena, 2 bd., 1ba., upstairs rear unit apartment, kitchen furnished with all appliances, all utilities incl., very private, avail. 8/15, \$1,200 + \$1,200 dep. 626/570-6123.
PASADENA house, San Rafael Hills, 5 min./JPL, 4 bd., 2 full ba., laundry rm., lg. living rm., newly painted and carpeted, modern kitchen w/ stove, oven, fridge, microwave, and breakfast area; large, private lot w/fully usable greenhouse, 2 lg. workshops, mature trees and a pond with/fountain, fish and lillies; \$2,800, in-cludes gardener. 323/255-6598.
PASADENA, furnished and unfurnished, 2 bd., 1.5 ba., townhome-style apt., a/c, laundry, parking, 2 mi. to Caltech, avail. 8/15, \$995 + util. for unfurn., \$1,150 + util. for furnished. 626/351-9641.
PASADENA, studio condo, 1115 E. Cordova, gated facility, fully furnished, tenant pays elec-tric, carport, laundry, no pets, non-smoker, \$825. 626/792-9053, Marilyn or Ray.
PASADENA, large furnished studio apt., w/sitting area, kitchen, bath, a/c, parking, near PCC and Caltech, great for co-ops or students, avail. 8/15, \$750 + utilities. 626/351-9641.
SOUTH PASADENA, fully furnished studio apt, 1718 Huntington Dr. betw. Marengo & Milan Sts, car space, laundry, utilities paid, no pets, non-smoker, \$750. 626/792-9053, Ray or Mari-lyn.
SAN MARINO, 2 bd., convertible den, sunroom, 1.75 ba., hardwood floors, crown moldings, beautiful landscaping, close to elementary and high school, north of Huntington Drive. 626/793-9943.

Vacation Rentals

BIG BEAR LAKEFRONT, luxury townhome, 2 decks, tennis, pool/spa, beautiful master bd. suite, sleeps 6. 949/786-6548.
CAMBRIA, ocean front house, sleeps up to 4, excellent view. 248-8853.
HAWAII, Kona, ocean front on Keauhou Bay, house and guest house comfortably sleep 6, 3 bd., 2 ba., rustic, relaxing and beautiful, swim-ming, snorkeling, fishing, spectacular view, near restaurants, golf and other attractions. 626/584-9632.
HAWAII, Maui condo, NW coast on beach w/ ocean view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, mcroww., d/w, pool, priv. lanai, slps 4, 4/15-12/14 \$105/nt./2, 12/15- 4/14 12/nt./2, \$10/nt. add'l person. 949/348-8047.
MAMMOTH, Chamonix condo, 2 bd., 2 full ba., sleeps 6, fully equipped elec. kitchen, includes microwave & extras, fireplace and wood, color TV, VCR, FM stereo, pool & sun areas, sauna, game and rec. rms, old Jacuzzi's, Indy. rms., BBQ areas, conv to hiking, shops, summer events, daily/weekly rates. 249-8524.
MAMMOTH, Courchevel, fully equipped unit, 2 bd., 2 ba., sleeps 6, summer rates for summer activities, fishing, mountain biking, hiking. 661/255-7958.
MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, sleeps 6-8, fully equipped kitchen incl. microwave, D/W, cable TV, VCR, phone, balcony w/view to mtns, Jacuzzi, sauna, streams, fishponds, close to Mammoth Creek, JPL discount. 626/798-9222 or 626/794-0455.
OCEANSIDE, on the sand, charming 1 bd. con-do, panoramic view, walk to pier & harbor, pool/spa, game rm., sleeps 4. 949/786-6548.
ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on priv. rd. 18-hole golf course 6 mi. away, priv. secure parking. 626/794-3906.
VENTURA, Beach cottage, 3 bd., 1 ba., sleeps 6, with TV, VCR, CD player, washer-dryer, back-yard BBQ, short walk to beach and Marina Park. 248-0521.